

**2. Remark/Discussion of Issues**

***Claims***

By the present amendment, claims 2 and 9 have been canceled, without prejudice and without disclaimer of the subject matter, and claims 1, 5, 8 and 13 have been revised. Claims 16-19 have been submitted for the Examiner's consideration.

Claims 1, 3-8, 10-13 and 16-19 are pending in the application, which Applicants respectfully submit are in condition for allowance.

***35 U.S.C. § 112, Second Paragraph, Rejections***

The Office Action rejects claims 1-13 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. *See* Office Action, p. 2.

In particular, with respect to claims 1, 9 and 13, the Office Action asserts that recitation of "no substantial heat transfer from the magnetic layer structure to an environment of the magnet layer structure" is unclear. Without acquiescing to the propriety of the rejection, Applicants have canceled claim 9 and have amended claims 1 and 13 to clarify that heat resulting from the current pulse is "substantially localized" within the magnetic layer-structure. In addition, claim 2 has been canceled by the present amendment, and claim 8 has been clarified to recite that the Neel or Currie temperature refers to the at least one bias layer.

Accordingly, withdrawal of the rejections 35 U.S.C. § 112, second paragraph, is respectfully requested.

***35 U.S.C. § 103 Rejections***

Applicants rely at least on the following standards with regard to proper rejections under 35 U.S.C. § 103(a). A *prima facie* case of obviousness has three requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, requires some reason that the skilled artisan would modify a reference or to combine references. *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, 411 F.3d 1332

(Fed. Cir. 2005). The Supreme Court has, however, cautioned against the use of “rigid and mandatory formulas” particularly with regards to finding reasons prompting a person of ordinary skill in the art to combine elements in the way the claimed new invention does. *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007). Second, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the same time the invention was made. In other words, a hindsight analysis is not allowed. *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200 (Fed. Cir. 1991). Lastly, the prior art reference or combination of references must teach or suggest all the limitations of the claims. *In re Wilson*, 424 F.2d 1382 (C.C.P.A. 1970).

Applicants’ silence on certain aspects of the rejection is by no means a concession as to their propriety. Rather, because the applied art fails to disclose at least one feature of the claims, for at least the reasons discussed below, Applicants respectfully submit that the rejections are improper and should be withdrawn.

#### *Claims 1-7*

The Office Action rejects claims 1-7 under 35 U.S.C. § 103(a) as being unpatentable over VOEGELI et al. (U.S. Patent No. 5,561,896) and evidenced by PELECKY et al. (“Magnetic Properties of Nanostructured Materials”) and FOX et al. (U.S. Patent No. 5,974,657). See Office Action, p. 3. Applicants respectfully traverse the rejection at least for the reasons set forth below.

#### Claim 1

Independent claim 1 has been revised, in part, to clarify selecting a physical process from a plurality of different physical processes having corresponding activation energies in the magnetic layer-structure based on the current pulse. The Office Action asserts that selecting a physical process from a plurality of physical processes is taught by heating a biasing region until a certain time period above a critical conversion temperature. See Office Action, p. 4 (citing VOEGELI et al., col. 5, lines 30-35). However, VOEGELI et al. only discloses one physical process, i.e., interdiffusion of constituents between layers of sensor laminate. See,

*e.g.*, col. 3, lines 50-60; col. 5, lines 30-35. Although interdiffusion may apparently be performed on different layers/materials, it is still the same physical process. *See, e.g.*, col. 5, lines 27-37; col. 6, line 66 – col. 7, line 2. Similarly, PELECKY et al. only discloses a process for changing magnetization of magnetic material (see, *e.g.*, p. 1771) and FOX et al. only discloses a process for resetting magnetization of pinned and hard biasing layers (see, *e.g.*, Abstract).

Accordingly, Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness, and that VOEGELI et al., PELECKY et al. and FOX et al., either alone or in any proper combination, do not teach or suggest all limitations of claim 1. The rejection of claim 1 under 35 U.S.C. § 103(a) therefore should be withdrawn.

#### Claims 2-7

Claim 2 has been canceled by the present amendment, and thus the rejection is moot. Claims 3-7 depend, directly or indirectly, from claim 1, and are therefore allowable for at least the reasons discussed with respect to claim 1, as well as in view of their additional recitations. Accordingly, the rejection of claims 2-7 under 35 U.S.C. §103(a) should be withdrawn.

#### *Claim 8*

The Office Action rejects claim 8 under 35 U.S.C. § 103(a) as being unpatentable over VOEGELI et al. evidenced by PELECKY et al. and FOX et al., and further in view of FOX et al. and MATTHEIS et al. (U.S. Patent App. Pub. No. 2001/0020847). *See* Office Action, p. 6. Applicants respectfully traverse the rejection at least because claim 8 depends from independent claim 1, which Applicants submit has been shown to be allowable.

Applicants further submit that claim 8 is allowable in view of its additional recitations. For example, the Office Action acknowledges that VOEGELI et al. evidenced by PELECKY et al. and FOX et al. are silent in applying a magnetic field to the at least one bias layer during the current pulse and switching off the magnetic field after a temperature of the bias layer decreases to below Néel or Curie temperature, and therefore relies on MATTHEIS et al. to teach the same. *See* Office Action, p. 7. In discussing MATTHEIS et al., the Office Action

states that “[a]lthough Mattheis does not explicitly teach turning off the magnetic field after reaching a Curie temperature; it would have been obvious to one of ordinary skill in the art that one would either turn off the magnetic field at or after reaching the Curie temperature ....”

See Office Action, pp. 7-8.

However, contrary to the Office Action’s assertion, MATTHEIS et al. specifically teaches away from the recitation of claim 8. For example, FIG. 7 of MATTHEIS et al. shows switching off an applied magnetic field (setting field) shortly after the temperature exceeds specific temperature  $T_s$ , which occurs before the end of an applied current pulse, and while the temperature is still rising. The description of FIG. 7 emphasizes this point:

The current is switched off at the instant  $t_3$ , and this leads to a lowering of the temperature. The setting field has already been lowered previously, and there is no longer any external field at the instant  $t_4$ .

MATTHEIS et al., para. [0110] (emphasis added). As clearly shown in FIG. 7, the temperature has not decreased to below the Néel or Curie temperature at instant  $t_4$ , and indeed has not yet even decreased to below the specific temperature  $T_s$ . In comparison, FIG. 3 of the present application (consistent with claim 8) clearly shows the magnetic field being applied until after the temperature has decreased significantly, and the Specification states that “[i]t is very important that the magnetic field is still present while the magnetic multilayer structure cools down.” See Specification, p. 11, lines 7-9.

Even the portion of MATTHEIS et al. relied upon by the Examiner states that the setting field is switched off long before the temperature decreases: “The switching-off time for the setting field is to be earlier than the instant at which, during return to the operating temperature, the temperature passes through a critical value for which the asymmetry obtained as a consequence of the temperature increase still exists.” See para. [0034] (emphasis added). Applicants submit that it appears “critical value” refers to the same temperature as specific temperature  $T_s$  shown in FIG. 7.

Accordingly, Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness with respect to claim 8 for this additional reason, as well, and that the rejection of claim 8 should be withdrawn.

***Claims 1-3 and 6-7***

The Office Action rejects claims 1-3 and 6-7 under 35 U.S.C. § 103(a) as being unpatentable over FOX et al. evidenced by PELECKY et al. and VOEGELI et al. *See* Office Action, p. 8. Applicants respectfully traverse the rejection at least for substantially the same reasons set forth above.

***Claim 8***

The Office Action rejects claim 8 under 35 U.S.C. § 103(a) as being unpatentable over FOX et al. evidenced by PELECKY et al. and VOEGELI et al. and MATTHEIS et al. *See* Office Action, p. 10. Applicants respectfully traverse the rejection at least because claim 8 depends from independent claim 1, which Applicants submit has been shown to be allowable, and at least for substantially the same additional reasons set forth above.

***Claim 9***

The Office Action rejects claim 9 under 35 U.S.C. § 103(a) as being unpatentable over GILL (U.S. Patent No. 6,292,335) in view of FOX et al. *See* Office Action, p. 11. Applicants note that claim 9 has been canceled by the present Amendment, and thus the rejection is moot.

***Claim 12***

The Office Action rejects claim 12 under 35 U.S.C. § 103(a) as being unpatentable over GILL in view of FOX et al. and further in view of LENNSEN et al. (U.S. Patent No. 6,501,678). *See* Office Action, p. 13. Applicants respectfully traverse the rejection at least because claim 12 depends indirectly from independent claim 1, which Applicants submit has been shown to be allowable, as well as in view of its additional recitations.

**35 U.S.C. § 102 Rejection - Claim 13**

The Office Action rejects claim 13 under 35 U.S.C. § 102(b) as being anticipated by LENSSEN et al. *See* Office Action, p. 14.

Applicants rely at least on the following standards with regard to proper rejections under 35 U.S.C. § 102. Notably, anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. *See, e.g., In re Paulsen*, 30 F.3d 1475, 31 USPQ2d 1671 (Fed. Cir. 1994); *In re Spada*, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990); *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983). Alternatively, anticipation requires that each and every element of the claimed invention be embodied in a single prior art device or practice. *See, e.g., Minnesota Min. & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992). For anticipation, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. *See, e.g., Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 1001 (Fed. Cir. 1991).

Applicants' silence on certain aspects of the rejections is by no means a concession as to their propriety. Rather, because the applied art fails to disclose at least one feature of the claims, for at least the reasons discussed below, Applicants respectfully submit that the rejections are improper and should be withdrawn.

Claim 13

Claim 13 recites, in part, that a current pulse is applied for offset compensation by irreversibly changing a resistance of at least one of the magnetoresistive bridge devices through local heating. The Office Action asserts that LENSSEN et al. discloses a structure having a magneto resistance effect by heating with a current pulse on or through the device under a magnetic field, so as to irreversibly change a resistance of at least one of the magnetoresistive bridge devices. *See* Office Action, p. 14 (citing LENSSEN et al., col. 11, lines 20-33). However, the cited portion of LENSSEN et al. discloses irreversible change in magnetization direction, not resistance. *See* col. 11, lines 19-34.

In the alternative, the Office Action relies asserts that claim 13 is obvious under 35 U.S.C. 103(a) in view of LENSSSEN et al. in combination with FOX et al. The Office Action relies on FOX et al. only to teach an electric current including a current pulse having a duration that prevents substantial heat transfer from the magnetic layer structure to an environment of the magnetic layer structure so that a temperature of the environment is substantially the same. See Office Action, pp. 14-15. FOX et al. therefore does not cure the deficiencies of LENSSSEN et al.

Accordingly, Applicants respectfully submit that the Examiner has not established a *prima facie* case of anticipation and/or obviousness, and that LENSSSEN et al. and FOX et al., either alone or in any proper combination, do not teach or suggest all limitations of claim 13. The rejection of claim 13 under 35 U.S.C. § 103(a) therefore should be withdrawn.

***New Claims – Claims 16-19***

By the present Amendment, claim 16-19 have been submitted for the Examiner's consideration. Applicants respectfully submit that claims 16-18 are allowable at least because they depend, directly or indirectly, from independent claim 1, which Applicants submit has been shown to be allowable, as well as in view of their additional recitations. Applicants further submit that claim 19 is allowable at least for substantially the same reasons discussed above with respect to claim 8.

**CONCLUSION**

In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 1, 3-8, 10-13 and 16-19, and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Van C. Ernest (Reg. No. 44,099) at (571) 283-0720 to discuss these matters.

Respectfully submitted on behalf of:  
Philips Electronics North America Corp.

A handwritten signature in black ink, appearing to read 'V-C Ernest', is written over a horizontal line.

by: Van C. Ernest (Reg. No. 44,099)

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Valentine & Whitt, PLLC  
One Freedom Square  
11951 Freedom Drive, Suite 1260  
Reston, Virginia 20190  
Telephone No.: (571) 283.0724  
Facsimile No.: (571) 283.0740